

Bacterial diversity in the rhizosphere of the Tinto River

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The Tinto River (Huelva, Spain), considered a Mars analog, constitutes an extreme environment with an acidic pH and a high concentration of heavy metals. These extreme conditions are generated by the metabolic activity of chemolithotrophic microorganisms growing in the complex sulfides of the Iberian Pyrite Belt. Previous studies demonstrated the abundance and diversity of eukaryotic microbes in the planktonic phase of the river, in contrast with the poor diversity of prokaryotic microbes. We are interested in the study of the prokaryotic diversity in another area of this environment, the soil at the banks of the river, which we expected to be higher than in the planktonic zone of the river, mainly due to the presence of nutrients coming from the roots exudates. To identify these microorganisms we sequenced 16S ribosome genes amplified from DNA samples isolated from the rizosphere of plants (mainly *Erica*) growing at the Tinto River banks. In addition, we are also isolating microorganisms directly from the roots, and they are also identified by 16S gene sequencing. The next step is the identification of the enzymatic activities involved in the survival of these microbes in this extreme environment. Then, we are constructing metagenome libraries which will be screened to search for enzymes involved in the tolerance to the heavy metals also present in the soil. An important goal of this research is also to investigate if the microorganisms are playing a role in the adaptation of the plants to this extreme environment.